AMENDMENT TO THE CLAIMS

1. (Currently amended) An apparatus for *in situ* monitoring of molten polycarbonate polymer and/or oligomer composition comprising:

a light source;

a fiber optic transmission probe, wherein said probe transmits at least one substantially monochromatic radiation from said light source to irradiate a molten sample comprising at least one polycarbonate polymer and/or oligomer and collects light transmitted from said irradiated sample;

a spectrophotometer, wherein said spectrophotometer monitors radiation comprising UV/visible light absorbed by said irradiated sample; and

a data analysis system, wherein said data analysis system correlates absorbance to at least one predetermined reaction component in said molten polycarbonate polymer and/or oligomer sample to provide real-time monitoring of the composition of said polycarbonate during production.

2. (Original) The apparatus of claim 1, wherein said probe is maintained at a substantially constant temperature.

3. (Original) The apparatus of claim 1, wherein said probe comprises a high temperature probe.

4. (Original) The apparatus of claim 3, wherein said probe is immersed in the polymer sample.

5. (Original) The apparatus of claim 3, wherein said probe operates at a temperature in the range from 200°C to 400°C.

6. (Original) The apparatus of claim 3, wherein said probe operates at a temperature in the range from 250°C to 350°C.

7. (Original) The apparatus of claim 3, wherein said probe operates at a temperature in the range from 260°C to 330°C.

8. (Original) The apparatus of claim 1, further comprising a filter positioned between said light source and said spectrophotometer.

9. (Original) The apparatus of claim 1, wherein said data analysis system comprises univariate analysis.

10. (Original) The apparatus of claim 1, wherein said data analysis system comprises multivariate analysis.

11. (Canceled)

12. (Original) The apparatus of claim 11, wherein said polycarbonate comprises melt polycarbonate.

13. (Original) The apparatus of claim 12, wherein said melt polycarbonate is produced by polymerization of bisphenol A (BPA) and diphenyl carbonate (DPC).

14. (Original) The apparatus of claim 1, wherein said reaction component comprises uncapped phenolic end-groups.

15 (Original) The apparatus of claim 1, wherein said reaction component comprises Fries products.

16. (Currently amended) The apparatus of claim 15, wherein said Fries ~~rearrangement~~ products consist of linear Fries products.

17. (Currently amended) The apparatus of claim 15, wherein said Fries ~~rearrangement~~ products consist of branched Fries products.

18. (Original) The apparatus of claim 15, wherein said monitored absorbance comprises at least one substantially monochromatic wavelength in the range of 250 to 450 nm.

19. (Original) The apparatus of claim 15, wherein said monitored absorbance comprises at least one substantially monochromatic wavelength in the range of 280 to 400 nm.

20. (Original) The apparatus of claim 15, wherein said monitored absorbance comprises at least one substantially monochromatic wavelength in the range of 290 to 330 nm.

21. (Original) The apparatus of claim 15, wherein said monitored absorbance comprises a wavelength of about 320 nm.

22. (Original) The apparatus of claim 1, wherein said monitored absorbance is correlated to predetermined reaction components comprising Fries products and uncapped phenolic end-groups.

23. (Original) The apparatus of claim 22, wherein said monitored absorbance comprises at least two substantially monochromatic wavelengths in the range of 250 to 450 nm.

24. (Original) The apparatus of claim 22, wherein said monitored absorbance comprises at least two substantially monochromatic wavelengths in the range of 260 to 400 nm.

25. (Original) The apparatus of claim 22, wherein said monitored absorbance comprises at least two substantially monochromatic wavelengths in the range of 270 to 340 nm.

26. (Original) Computer readable media comprising software code for the apparatus of claim 1.

27. (Currently amended) A method for *in situ* monitoring of molten polycarbonate polymer and/or oligomer composition comprising:

providing an optical contact between a fiber optic probe and a stream of a molten sample comprising at least one polycarbonate polymer and/or oligomer;

irradiating the molten sample with at least one wavelength of substantially monochromatic radiation;

monitoring UV/visible light adsorbed by the molten sample; and

correlating the UV/visible light absorbed by the irradiated molten sample to levels of at least one reaction component of interest in said molten polycarbonate polymer and/or oligomer sample to provide real-time monitoring of the composition of said polycarbonate during production.

28. (Original) The method of claim 27, wherein the probe is maintained at a substantially constant temperature.

29. (Original) The method of claim 27, further comprising using a high temperature probe for irradiating the polymer and collecting light transmitted from the polymer.

30. (Original) The method of claim 29, wherein the probe is immersed directly in the polymer sample.

31. (Original) The method of claim 29, wherein said probe operates at a temperature in the range from 200°C to 400°C.

32. (Original) The method of claim 29, wherein said probe operates at a temperature in the range from 250°C to 350°C.

33. (Original) The method of claim 29, wherein said probe operates at a temperature in the range from 260°C to 330°C.

34. (Original) The method of claim 27, wherein the sample comprises melt polycarbonate.

35. (Original) The method of claim 34, wherein the melt polycarbonate is produced by polymerization of bisphenol A (BPA) and diphenyl carbonate (DPC).

36. (Original) The method of claim 27, wherein the step of correlating the UV/visible light absorbed by the irradiated molten sample to levels of a reaction component of interest further comprises univariate analysis.

37. (Original) The method of claim 27, wherein the step of correlating the UV/visible light absorbed by the irradiated molten sample to levels of a reaction component of interest further comprises multivariate analysis.

38. (Original) The method of claim 27, wherein the reaction component comprises uncapped phenolic end-groups.

39. (Currently amended) The method of claim 27, wherein the reaction component comprises Fries products.

40. (Currently amended) The method of claim 39, wherein the reaction component consists of linear Fries products.

41. (Currently amended) The method of claim 39, wherein the reaction component consists of branched Fries products.

42. (Original) The method of claim 39, wherein the monitored absorbance comprises at least one substantially monochromatic wavelength in the range of 250 to 450 nm.

43. (Original) The method of claim 39, wherein the monitored absorbance comprises at least one substantially monochromatic wavelength in the range of 280 to 400 nm.

44. (Original) The method of claim 39, wherein the monitored absorbance comprises at least one substantially monochromatic wavelength in the range of 290 to 330 nm.

45. (Original) The method of claim 39, wherein the monitored absorbance comprises a wavelength of about 320 nm.

46. (Original) The method of claim 27, wherein the monitored absorbance is correlated to reaction components comprising Fries products and uncapped phenolic end-groups.

47. (Original) The method of claim 46, wherein the monitored absorbance comprises at least two substantially monochromatic wavelengths in the range of 250 to 450 nm.

48. (Original) The method of claim 46, wherein the monitored absorbance comprises at least two substantially monochromatic wavelengths in the range of 260 to 400 nm.

49. (Original) The method of claim 46, wherein the monitored absorbance comprises at least two substantially monochromatic wavelengths in the range of 270 to 340 nm.

50. (Canceledl)

51. (Original) The method of claim 27, wherein irradiation and monitoring of light absorbed is performed on combinatorial libraries of samples.

52. (Previously presented) The method of claim 27, further comprising evaluating the monitored absorbance to determine whether any one of a set of preselected reaction components needs to be adjusted.

53. (Original) Computer readable media comprising software code for performing the method of claim 24.

54. (Original) A method for real time monitoring of molten polycarbonate composition during production comprising:

positioning an optical probe in optical contact with a stream of molten sample comprising at least one polymer and/or oligomer such that the probe maintains a substantially constant temperature;

irradiating the molten sample with at least one wavelength of substantially monochromatic radiation;

monitoring UV/visible light absorbed by the irradiated sample; and

correlating the light absorbed by the irradiated sample to levels of Fries products.

55. (Original) A method for real time monitoring of molten polycarbonate composition during production comprising:

positioning an optical probe in optical contact with a stream of molten sample comprising at least one polymer and/or oligomer, such that the probe comprises a substantially constant temperature;

irradiating the molten sample with at least two wavelengths of substantially monochromatic radiation;

monitoring UV/visible light absorbed by the irradiated sample; and

correlating the light absorbed by the irradiated sample to levels of Fries products and phenolic end-groups.

56. (Original) A method for real time monitoring of molten polycarbonate composition during production comprising:

positioning an optical probe in optical contact with a stream of molten sample comprising at least one polymer and/or oligomer, such that the probe comprises a substantially constant temperature;

irradiating the molten sample with at least three wavelengths of substantially monochromatic radiation;

monitoring UV/visible light absorbed by the irradiated sample; and

correlating the light absorbed by the irradiated sample to levels of linear Fries products, branched Fries products, and phenolic end-groups.

57. (New) An apparatus for *in situ* monitoring of molten polycarbonate polymer and/or oligomer composition comprising:

a light source;

a fiber optic transmission probe, wherein said probe transmits at least one substantially monochromatic radiation from said light source to irradiate a molten sample comprising at least one polycarbonate polymer and/or oligomer and collects light transmitted from said irradiated sample;

a spectrophotometer, wherein said spectrophotometer monitors radiation comprising UV/visible light absorbed by said irradiated sample; and

a data analysis system, wherein said data analysis system correlates absorbance to at least one predetermined reaction component in said molten polycarbonate polymer and/or oligomer sample, and wherein said reaction component comprises uncapped phenolic end-groups.

58. (New) An apparatus for *in situ* monitoring of molten polycarbonate polymer and/or oligomer composition comprising:

a light source;

a fiber optic transmission probe, wherein said probe transmits at least one substantially monochromatic radiation from said light source to irradiate a molten sample comprising at least one polycarbonate polymer and/or oligomer and collects light transmitted from said irradiated sample;

a spectrophotometer, wherein said spectrophotometer monitors radiation comprising UV/visible light absorbed by said irradiated sample; and

a data analysis system, wherein said data analysis system correlates absorbance to at least one predetermined reaction component in said molten polycarbonate polymer and/or oligomer sample, and wherein said reaction component comprises Fries products.

59. (New) The apparatus of claim 58, wherein said Fries products consist of linear Fries products.

60. (New) The apparatus of claim 58, wherein said Fries products consist of branched Fries products.

61. (New) The apparatus of claim 58, wherein said monitored absorbance comprises at least one substantially monochromatic wavelength in the range of 250 to 450 nm.

62. (New) The apparatus of claim 58, wherein said monitored absorbance comprises at least one substantially monochromatic wavelength in the range of 280 to 400 nm.

63. (New) The apparatus of claim 58, wherein said monitored absorbance comprises at least one substantially monochromatic wavelength in the range of 290 to 330 nm.

64. (New) The apparatus of claim 58, wherein said monitored absorbance comprises a wavelength of about 320 nm.

65. (New) The apparatus of claim 58, wherein said data analysis system comprises multivariate analysis.

66. (New) An apparatus for *in situ* monitoring of molten polycarbonate polymer and/or oligomer composition comprising:

a light source;

a fiber optic transmission probe, wherein said probe transmits at least one substantially monochromatic radiation from said light source to irradiate a molten sample comprising at least one polycarbonate polymer and/or oligomer and collects light transmitted from said irradiated sample;

a spectrophotometer, wherein said spectrophotometer monitors radiation comprising UV/visible light absorbed by said irradiated sample; and

a data analysis system, wherein said data analysis system correlates absorbance to at least one predetermined reaction component in said molten polycarbonate polymer and/or oligomer sample, and wherein said monitored absorbance is correlated to Fries products and uncapped phenolic end-groups.

67. (New) The apparatus of claim 66, wherein said monitored absorbance comprises at least two substantially monochromatic wavelengths in the range of 250 to 450 nm.

68. (New) The apparatus of claim 66, wherein said monitored absorbance comprises at least two substantially monochromatic wavelengths in the range of 260 to 400 nm.

69. (New) The apparatus of claim 66, wherein said monitored absorbance comprises at least two substantially monochromatic wavelengths in the range of 270 to 340 nm.

70. (New) The apparatus of claim 66, wherein said data analysis system comprises multivariate analysis.

71. (New) A method for *in situ* monitoring of molten polycarbonate polymer and/or oligomer composition comprising:

providing an optical contact between a fiber optic probe and a stream of a molten sample comprising at least one polycarbonate polymer and/or oligomer;

irradiating the molten sample with at least one wavelength of substantially monochromatic radiation;

monitoring UV/visible light adsorbed by the molten sample; and

correlating the UV/visible light absorbed by the irradiated molten sample to levels of at least one reaction component of interest in said molten polycarbonate polymer and/or oligomer sample, wherein the reaction component comprises uncapped phenolic end-groups.

72. (New) A method for *in situ* monitoring of molten polycarbonate polymer and/or oligomer composition comprising:

providing an optical contact between a fiber optic probe and a stream of a molten sample comprising at least one polycarbonate polymer and/or oligomer;

irradiating the molten sample with at least one wavelength of substantially monochromatic radiation;

monitoring UV/visible light adsorbed by the molten sample; and

correlating the UV/visible light absorbed by the irradiated molten sample to levels of at least one reaction component of interest in said molten polycarbonate polymer and/or oligomer sample, wherein the reaction component comprises Fries products.

73. (New) The method of claim 72, wherein the reaction component consists of linear Fries products.

74. (New) The method of claim 72, wherein the reaction component consists of branched Fries products.

75. (New) The method of claim 72, wherein the monitored absorbance comprises at least one substantially monochromatic wavelength in the range of 250 to 450 nm.

76. (New) The method of claim 72, wherein the monitored absorbance comprises at least one substantially monochromatic wavelength in the range of 280 to 400 nm.

77. (New) The method of claim 72, wherein the monitored absorbance comprises at least one substantially monochromatic wavelength in the range of 290 to 330 nm.

78. (New) The method of claim 72, wherein the monitored absorbance comprises a wavelength of about 320 nm.

79. (New) The method of claim 72, wherein the step of correlating the UV/visible light absorbed by the irradiated molten sample to levels of a reaction component of interest further comprises multivariate analysis.

80. (New) A method for *in situ* monitoring of molten polycarbonate polymer and/or oligomer composition comprising:

providing an optical contact between a fiber optic probe and a stream of a molten sample comprising at least one polycarbonate polymer and/or oligomer;

irradiating the molten sample with at least one wavelength of substantially monochromatic radiation;

monitoring UV/visible light adsorbed by the molten sample; and

correlating the UV/visible light absorbed by the irradiated molten sample to levels of at least one reaction component of interest in said molten polycarbonate polymer and/or oligomer sample, wherein the monitored absorbance is correlated to Fries products and uncapped phenolic end-groups.

81. (New) The method of claim 80, wherein the monitored absorbance comprises at least two substantially monochromatic wavelengths in the range of 250 to 450 nm.

82. (New) The method of claim 80, wherein the monitored absorbance comprises at least two substantially monochromatic wavelengths in the range of 260 to 400 nm.

83. (New) The method of claim 80, wherein the monitored absorbance comprises at least two substantially monochromatic wavelengths in the range of 270 to 340 nm.

84. (New) The method of claim 80, wherein the step of correlating the UV/visible light absorbed by the irradiated molten sample to levels of a reaction component of interest further comprises multivariate analysis.

85. (New) A method for *in situ* monitoring of molten polycarbonate polymer and/or oligomer composition comprising:

providing an optical contact between a fiber optic probe and a stream of a molten sample comprising at least one polycarbonate polymer and/or oligomer;

irradiating the molten sample with at least one wavelength of substantially monochromatic radiation;

monitoring UV/visible light adsorbed by the molten sample; and

correlating the UV/visible light absorbed by the irradiated molten sample to levels of at least one reaction component of interest in said molten polycarbonate polymer and/or oligomer sample, further comprising evaluating the monitored absorbance to determine whether any one of a set of preselected reaction components needs to be adjusted.